

## Session 70

## Theatre 2

### **Mitigating the risk of human occupational leptospirosis by vaccinating pastoral farmed livestock**

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Leptospirosis is a disease of mammals caused by a multitude of *Leptospira* and subtypes (serovars), most of them without cross-protective host-immunity. The incidence of notified human leptospirosis cases in New Zealand (2.5 per 100,000) is the highest among OECD countries. Serovars found in 50-60% of human cases were *Leptospira borgpetersenii* serovar *Hardjobovis* (H) or *L. interrogans* serovar *Pomona* (P). A recent stratified-random survey of pastoral livestock farms found serological evidence of H or P serovars in more than 50% of adult sheep and beef cattle and in 34% of adult deer. The survey excluded dairy cattle because about 85% dairy herds are vaccinated annually. Leptospirosis is therefore an occupational disease in humans with farmers, abattoir workers and livestock service personnel including veterinarians being at 50-200 times higher risk of infection and disease than the general population. Vaccination of livestock appears to be the major if not the only effective option for control. A series of studies conducted in past years (2003-2011) described the prevalence of infection and kidney culture positive rates in sheep carcasses at slaughter, the daily contact rate of abattoir workers with carcasses shedding H or P, the prevalence and sero-conversion rate of abattoir workers processing sheep, deer and cattle, and the association of sero-conversion with influenza-like symptoms resembling clinical leptospirosis in abattoir workers. This presentation puts these findings into an ecological perspective: it describes a generic model of infection dynamics among domestic pastoral livestock, its contribution to human exposure and infection, and the consequences of human illness. The model evaluates the level of protection achievable in humans through vaccination of livestock, as this is currently a critical question for authorities and individuals engaged in public health and occupational safety and health.